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AUTHOR Englund, Tomas; Svingby, Gunilla
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ABSTRACT

Curriculum theory, curriculum development in Swedish schools, the need to reconceptualize curriculum theory, and the scientific approach to education are discussed. Section 1 of the paper describes 3 theories: traditionalism accepts the curriculum as it is; conceptual empiricism is primarily concerned with academic disciplines (student learning is secondary); and reconceptualization perceives curriculum and curriculum research as politically emancipatory. Section 2 outlines curricular concerns in Sweden from 1978-1980, with an emphasis on a 1979 proposal which stated that subject goals should express the general aims of the school system; teaching content should be better related to students' situations, knowledge, and experiences; and central concepts must be defined. The third major section discusses the need for reconceptualization of curriculum theory, using social studies as an example. The point is that "scientification" of subject matter can be one-sided, that guidelines must disengage from narrow science concepts, and that content of school subjects must be directed by curricularists who are responsible to politicians. The final section brings into question the "scientification" of teaching, curriculum, and education in general and concludes that the content of schooling is not a scientific issue but a political one. (KC)

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SCIENTIFICATION OF TEACHING - A CONCEPT TO BE QUESTIONED

TOMAS ENGLUND
GUNILLA SVINGBY

DEPARTMENT OF EDUCATION
UNIVERSITY OF GÖTEBORG
BOX 1010, S-431 26 MÖLNDAL, SWEDEN

Sö 04 344

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SCIENTIFICATION OF TEACHING - A CONCEPT TO BE QUESTIONED

Tomas Englund Gunilla Svingby

INTRODUCTION - THE PROBLEM

The theme of the symposium is the scientification of teaching. In this paper it is our intention to discuss this as a social phenomenon. Two points will be made.

1. The meaning of the term *scientific* as a criteria of teaching will be questioned. Scientific will not a priori be treated as a true, objective description of the world around us. In our discussion scientific and the scientification of teaching will be treated as a social phenomenon and thus related to the (past and actual) social construction of reality.
2. The second point is closely related to the first. By pointing to the social relevance and historical origin of the school subjects, the differences *between* subjects and the differences embedded *within* a certain subject, when taught in different types of schools and to certain students, will appear.

In this analysis the recent swedish curriculum development will be used as an illustration. A short description of this development will thus be made.

A BACKGROUND

Back to basics

A wellknown international fact is that the "back-to-basics-movement" is expanding and growing stronger. This is also manifested in the swedish parliamentary proposition of 1979 and in the central curriculum for the comprehensive school in 1980. The stress on basic knowledge in the swedish docu-

ments can be seen as a necessary step in relation to the actual and historic situation, but it also has its international parallels (Broudy 1972). What is of interest here, is the possible consequences of this movement for the content of the school subjects. When in the swedish document the central concepts are stressed, it may indicate a strenghtening of the subjects in their traditional forms, which is an atomistic knowledge approach based on positivistic science.

Three curriculum traditions

Theories of curriculum have often been described in the categories discipline-centered versus child-centered. In this distinction, theories concentrating on the scientific content (structure, methods etc.) of the discipline is contrasted to theories concentrating on the "needs" of the students. Neither extremes paying much attention to the relation between content and the structure of society nor to the relation between the experiences and interests of a child and his societal position.

In a critical article on the development of curriculum theory in USA Pinar (1978) has another categorisation. He uses three broad categories:

Traditionalism
Conceptual-empiricism
Reconceptualism

By *traditionalism* Pinar refers to the atheoretical work near the practitioner that has grown to a bureaucratic model in Kliebards (1975) terminology, and implicates a technological rationality according to MacDonalds (1975) analysis. For a swedish example, see Svingby 1981.

The curriculum worker is dedicated to "improvement" of schools and he honours this dedication by accepting the curriculum as it is. Curriculum change is measured by comparing resulting behaviours with original objectives. Even humanistic educators tend to accept many of these premises, as they introduce e.g. "values clarification" into the school curriculum.

The second, the *conceptual empiricism* , questions the sequency of the content and they often look on education not as a discipline in itself but an area to be studied by the disciplines behind the school subjects. Pinar means that a great deal of this research has left the school field and that the cognate field is the primary.

But, important is, that both the traditionalists and the conceptual-empiricists share the basic assumptions of the culture of positivism. Furthermore, these assumptions shape their view of scientific knowledge, classroom pedagogy as well as classroom evaluation and research. And what's more, those assumptions are rooted in a specific historic, socioeconomic and political context.

As one american analyst recently has said:

> "Both the traditionalists and conceptual-empiricists in the curriculum field share the basic assumptions of the culture of positivism. Furthermore, these assumptions shape their view of social science knowledge, classroom pedagogy, as well as classroom evaluation and research. In brief, both groups support a form of positivist rationality in which it is assumed that: (1) The natural sciences provide the 'deductive-nomological' model of explanation for the concepts and techniques proper for social science. (2) Social science ought to aim at the discovery of lawlike propositions about human behavior which are empirically testable. (3) Social science modes of inquiry can and ought to be objective. (4) The relationship between theory and practice in the social science domain is primarily a technical one, i.e., social science knowledge can be used to predict how a course of action can best be realized. (5) Social science procedures of verification and falsification must rely upon scientific techniques and 'hard date', which lead to results that are value free and intersubjectively applicable." (Giroux 1980).

The work of the *reconceptualists* is distinguishable from the work of the conceptual-empiricists in two significant respects according to Pinar: 1) a "value-laden" perspective and 2) a perspective with a politically emancipatory intent. A reconceptualist tends to see research as an inescapably political as well as intellectual act. As such, it works to suppress or to liberate, not only those who conduct the research, and those upon whom it is conducted, but as well those outside the academic subculture.

The categories may be a bit crude, especially what is defined as traditionalism. The focus is, however, on the difference between curriculum theories concentrating on the relation of school subjects and scientific disciplines on the one hand (empirical conceptualism) and theories of the social relevance of subject matter content on the other hand (reconceptualism).

Conceptual empiricism in Sweden

Research on the content of subjects has not a strong tradition in Sweden. Recently such research has, however, started in Gothenburg. In arithmetic

Kilborn & Johansson (1979) have studied errors made by pupils and the structure of teaching. Andersson et al (1979) and Lybeck (1979) are studying concepts of physics as they are comprehended by pupils and presented in teaching. They are aiming both at a description of ways students comprehend certain concepts and to draw conclusions to the teaching of these concepts.

This research could be classified as empirical-conceptualism and could be criticized for being interested mainly in how pupils comprehend a specific content, not in the content itself or its societal-ideological character.

Referring to a conference report presented in 1980, where the research of the Gothenburg-group is presented a more qualified picture appears. Marton (1980) stresses the unity of content and the experiences of the pupils. He says:

> "Content does not exist on its own. Content exists only as it is understood by pupils and teachers..... It's not so much a question of referring to the content when discussing knowledge, learning, teaching etc but of discussing in terms of the content."

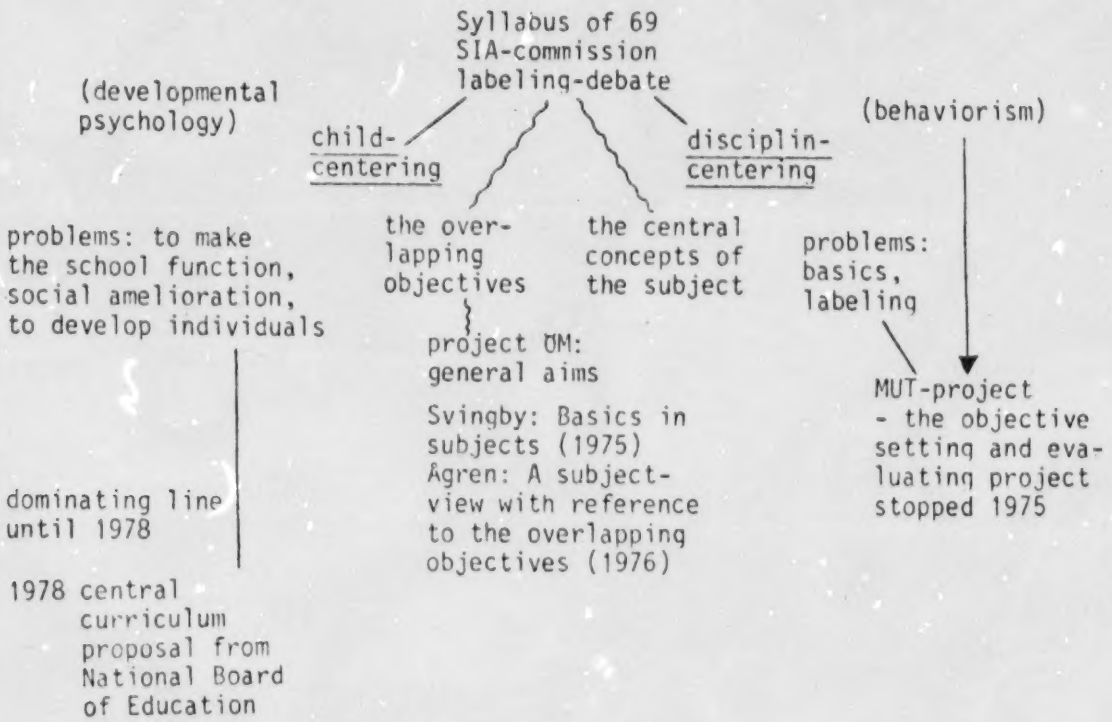
When Lybeck studies students comprehension of proportions (1980) the interest is on both the thinking of the children in relation to a specific context and on the content itself. Lybeck classifies the way students think in two main categories - one that is abstract and generative and leads to further studies and one that is a sort of pragmatic, common-sense knowledge that leads to correct solutions of most everyday problems but which is a barrier towards furhter studies. The research poses questions of relevance and functionality and questions of social origin of thinking. Which principle should be taught? To which students? Who shall decide upon this? How generative and how functional are different forms of thinking and comprehending? How are different forms of thinking distributed among students? Which relation do they have to the culture of the students? and to the educational carriers?

The research done by the Marton-group does mean a step forward from the restricted discipline-centered and empirical-conceptualist theory described by Pinar. What is important is that the content is studied not only from a discipline-point and not only from a student-point but from both. A second step will be to start from the assumption that pupils meet the content with different presumptions. The fact that pupils live under different social conditions leads to different apprehensions of the same content. This will make necessary research not only of the different ways students comprehend a certain concept but also what constitutes the variations. The reconceptualist view would stress the social relevance of such variations.

Before going further we want to relate this curricular problem to a concrete social situation, the recent swedish curriculum development.

SCIENTIFICATION AS A SOCIAL PHENOMENON: THE CURRICULAR CONDITIONS AND DEVELOPMENT IN SWEDEN DURING THE SEVENTIES

In the 1969 curriculum for the swedish comprehensive school we see two distinct lines embedded which shortly may be characterized as childcentered and disciplincentered views. We have constructed the following figure to illustrate our description:


Syllabus of 69
SIA-commission
labeling-debate
(developmental psychology)
child-centering
disciplin-centering
(behaviorism)
problems: to make the school function, social amelioration, to develop individuals
the over-lapping objectives
the central concepts of the subject
problems: basics, labeling
project ÖM: general aims
Svingby: Basics in subjects (1975)
Ågren: A subject-view with reference to the overlapping objectives (1976)
MUT-project - the objective setting and evaluating project stopped 1975
dominating line until 1978
1978 central curriculum proposal from National Board of Education

1979 The parliamentary proposition concerning the central curriculum

1980 feb Central curriculum part I

1980 april Central curriculum part II: Syllabus/subject course plan. Proposal from the National Board of Education

1980 oct Central curriculum part II. The definitive product from the Ministry of Education

At the same time as the new curriculum for the compulsory comprehensive school was decided in 1969 a commission was set up, SIA: The school's inner

work, which had to investigate especially the problem of weak performance. Simultaneously there was also a lively debate on labeling.

The MUT-project with its technological viewpoint did in one way answer those problems and 1969 central curriculum in an other. In the MUT-project the general aims and the content of every school subject should both be expressed in terms of pupils behaviour. In the central curriculum the personal development of every child was in focus. In the second perspective the pupil is a subject, and in the first an object. It is relevant to question how compatible these two models are. In 1975, the MUT-project was stopped, reference being made to the views presented by the SIA-commission. Were these two models fundamentally antagonistic or was there simply a psychological language that disturbed the convergence? In neither of these two models, except for the last period of MUT, the content of the school subjects was really questioned. In the original MUT-model the objectives of every subject were to be presented in terms of pupils behaviour. In the childcentered model the content of the school subject was secondary. Focus was on the children's development as a whole.

But already in the directives to the MUT-project (1974) there was said that

> "a specification of the basics and an explicit relation of those to the central concepts and knowledge areas is necessary to build up a structure in different subjects".

It was also these demands plus the protest against the technocratic model that in some groups of the project during the last year, laid the ground for a very interesting deeper debate on the subjects central concepts. However this model was not the prevalent. The MUT-project died (1975).

Up to 1978 the child-centered model (with MUT as an exception) was more or less dominant. But with the parliamentary proposition in 1979 there was a definite change, which in some aspects also had its origin in the SIA-commission. Although the 1979 proposition had its basis in the SIA-proposition (from 1976) it represented a change in direction of those aspects in which we are interested. From this perspective the parliamentary proposition of 1979 stating directions of the charachter of a new central curriculum for the comprehensive school, in many aspects represents a new thinking.

The proposition states (1) that central concepts and structures of the subjects must be defined.

> "There are reasons to give more definitive guide-lines (that in the curriculum of 1969) through the subject goals. If the goals only ex-

presses the wish that the students learn to understand important relations of nature and society, both teacher and pupils will be unsure of *what* aspects are central. It should be possible to define, through subject-goals, the central concepts as well as the central skills, which are necessary for every pupil to learn.

Central concepts of the social science sector could be exemplified: rights, duties, power, tolerance, representativity. If the curriculum goals state such concepts it will be much easier to chose a content that leads to an insight in important causalities."

This means, a curriculum that defines the central concepts thus making it possible for pupils to obtain insight and a holistic view.

The proposition further states (2) that the subject-goals should express the general aims of the school system. These goals it is said, can be reached by certain methods but not by others. What then are those general aims of the school system? The 1980 central curriculum states:

"The comprehensive school is a part of the swedish society. The central curriculum mirrors the ideals of democracy regarding society and man: man is active, creative, has the capacity to take a responsibility and to seek knowledge with the intent to understand and better the living conditions of her/his own and of others. The content and working forms of the school must promote these ideals. The school has to give the pupils a responsibility and influence over school according to their age and maturity."

(3) The proposition also states, that the teaching content must be (better) related to the students "situation, knowledge and experiences". This is important as

"every content has a social background. If the teaching will not have negative effects on the personal development, education and vocational career of pupils it is important that the curriculum content of the central curriculum is concrete and that it is tied to different social and cultural realities."

This aspect of content was delegated to the continuing central and local curriculum work.

The problem is of course to make these demands compatible and concrete in the course plan of every subject. A subproblem is the difference between school subjects, different subjects having different qualifications for filling the above three demands. The official answer to these demands was the proposal of the National Board in april 1980. For obvious reasons there was no project or group that had for a long time made any serious attempt to discuss all the demands together. In the proposal for the new second part of the central curriculum, the subject course plans thus some subjects were

treated more elaborately than others. In mother-tongue for instance there was an attempt to meet the demand to include the general aims in the school subject. This work had its roots in the project ÖM - General aims (övergripande mål). Already in the introductory report in 1973 it's said that an attempt should be made to develop a subjectview from the principles embedded in the general aims. Through the research of especially Monica Agren in that project this attempt has been carried out. An interesting attempt to meet all three demands was made in art.

However, the proposal from the National Board was partly rejected by the Ministry of Education. The rejection showed the dynamics of the three demands when transformed into syllabus, that the realisation of the demands is also a question of working methods and that method can not be separated from content. It also indicated the importance of the differences between subjects.

DIFFERENCES BETWEEN SUBJECTS AND WITHIN SUBJECTS

A point of certain interest in this context is the fact that a school-subject is not an unambigious or constant concept. On the contrary, the content and goals of a certain subject varies from time to time as well as in a certain time-period according to what type of school it is taught in. School-subjects vary both in their historic origin and social meaning.

Social studies, a subject that has explicit socialisation functions has not the same content when it is taught to pupils on theoretical lines in the gymnasium as when it is taught in practical lines. An example of the different meanings attached to a subject when taught under different organisational settings and to different groups of students is given by Keddie's well-known study (1971) of teachers. Conceptions of a suitable content for students of different streams.

School subjects in the natural science sector do not have the same history as subjects in the social science sector. History and religion do not have the same social relevance today as they had in the nineteenth century. Compare for instance subjects in the natural science sector with subjects like art, handicraft and "barnkunskap". Mathematics and physics have a long tradition as school subjects. They are established academic disciplines with a well-developed tradition and conceptual apparatus. They are also es-

tablished instruments in the sorting of students on different carriers. Through mathematics and physics - "the difficult subjects" - the bad student are sorted out. As is well-known, girls and working-class children drop out more often than boys, especially boys with a middle-class background. Mathematics and physics can as Kyle has demonstrated (1972) be seen as integrative parts of the male and dominating culture.

Subjects as handicraft and art have a quite different position. These subjects have no long academic tradition and no established scientific discipline. Their existence in the curriculum is not motivated by their value for an academic carrier or industrial benefit or their value for sorting matters.

Their existence in the curriculum is instead dependent on quite other matters. Handicraft, that is needlework for girls and woodwork for boys, was introduced in the elementary school to give working class children useful skills in taking care of home and family in a period when the traditional socialisation in the homes was disappearing. The motivation for such subjects is today a more unspecific usefulness as transmitter of a cultural tradition. A political demand on equality between the sexes can be added.

The more unspecific reasons for these and similar subjects in the curriculum does not mean that they lack societal significance, but that they have specific roles in the reproduction of the societal structure and implementation of political ideologies.

The development over time of social studies in Sweden is a good example of the social dependency of content.

In a study of Bromsjö (1965) a representative group of teachers ranked different goals of social studies. The rankings were linked to school-types. Teachers working in "folkskolan" gave priority to moments fostering cooperativeness, responsibility, respect to laws and authority etc , moments that were given low priority by teachers in "realskola". Those teachers stressed knowledge of the structure and organisation of society, while teachers of girls'-schools gave priority to the utility of what was learned. The important for girls were to learn where to get service in practical situations. A similar result is presented by Kyle (1972) in her study of curricula and textbook for different school-types during the nineteenth century.

An analysis of the curriculum content of social studies over time (Svingby 1981) shows how the content adapts to conditions within and outside school. As social studies has the explicit function of socialisation of pupils into the prevailing social order based on certain economic and social relations and at the same time to further political aims of equality and democracy, it is much more open to external influences than subjects like physics which has a more distinct inner logic (Englund 1980).

SOCIAL STUDIES AND CENTRAL CONCEPTS - THE NEED FOR A RECONCEPTUALIST CURRICULAR STANDPOINT

In the 1979 parliamentary proposition the central concepts of the social study sector are exemplified by the following, tolerance, power, representativity, rights and obligations. These concepts are of course not sufficient. But they are a good starting point. It is also in the social study sector that a great deal of the above said can be applied. It is in this sector especially that the pupil through central concepts can reach insight into a coherent system, grasp a totality (for instance the concept imperialism which is mentioned in the recent swedish debate, not of course in the syllabus, and is discussed in Hakkarainen (1981). Of course such a model is also applicable to physics, chemistry and so on - the whole orientation sector (social studies and natural studies). But this presents further problems, for instance around concepts like ecology. In what school subject can you scientificate ecology? And what then are the central concepts of mother-tongue?

And what is a scientification of social studies? Since 1962 in Sweden we have had a comprehensive compulsory nine-year-school, social studies has shown an explicit picture of social amelioration, consensus. In the 1979-80 curriculum reform it's a shift saying that conflicts and different valuations should be discussed. But from an american viewpoint

> "Popkewitz has argued cogently that many of the social studies curriculum projects that came out of the discipline-based curriculum movements of the sixties did more to impede critical inquiry than to promote it. Based on fundamentally flawed assumptions about theory, values, knowledge, and instructional techniques in social studies curricular design and implementation, these projects 'ignored the multiplicity of perspectives found in any one discipline'. With the social nature of conflict and skepticism removed from these projects, ideas appear as inert and ahistorical, reified categories whose underlying ideology is only matched by the tunnel vision they produce.

> Human intentionality and problem solving in these texts are either ignored or stripped of any viable, critical edge. For instance, in one set of texts pioneered under the inquiry method, comparative analysis exercises are undercut by the use of socially constructed biases built into definitional terms that distort the subjects to be compared. In analyzing the political systems of the United States and the Soviet Union, the United States is labeled as a 'democratic system' and the Soviet Union as a 'totalitarian state'. Needless to say, the uncriticized and simplistic dichotomy revealed in categories such as these represent nothing other than an updated version of the vulgar 'democracy' vs. 'communism' dichotomy that characterized so much of the old social studies of the 1950s and early 1960s. While the labels have changed, the underlying typifications have not. What is new is not necessarily better. The 'alleged' innovative discipline-centered social studies curriculum of the last fifteen years has based its reputation on its claim to promote critical inquiry. Instead, this approach appears to have created 'new forms of mystification which make the social world seem mechanistic and predeterministic'." (Giroux 1980).

In spite of these remarks there is a definite potential in the orientation sector to build up a structure of knowledge from central concepts. But *how* will these concepts be chosen? Which concepts are fundamentally knowledge-generating? How should a multiplicity of perspectives be guaranteed? Is it primarily the underlying scientific disciplines that are the bearers of the central concepts of the school subject? What is, for instance, the underlying discipline of the swedish school subject "barnkunskap"? Is developmental psychology the best way to reach the central concepts of this school subject? No, a broader perspective is of course necessary.

In short we mean that the scientification of the content of the school subjects must be combined with other demands, especially those mentioned from the swedish parliamentary proposition. As principles the democratic ambitions of every subject and relation of knowledge to different social and cultural realities are written down in the 1979 proposition but they are not further elaborated on. Such an elaboration is needed and with that we mean reconceptualist curriculum theorizing.

As we understand it, in spite of the criticism, it is in this way the conceptual-empiricist tradition may develop new demands on the content of the school subjects.

In summary, to conform to the demands of the parliamentary proposition there are totally different possibilities for different school subjects and also risks in a onesided scientification. Some guidelines for future development must be a disengagement from the narrow science concepts and the content of the school subjects put in a wider scope directed by curricularists with a reconceptualist view, responsible in their turn to the politicians.

SCIENTIFICATION OF TEACHING - A CONCEPT TO BE QUESTIONED

Scientification is without doubt a well established trend in the educational debate. The well-known Sputnik-shock and its demands on a better = more scientific teaching (of mathematics) in USA has had its backwash also in the nordic countries (e.g. the modern math) The claim for scientific teaching has, however, other roots. It also contains a variety of meanings. Scientific teaching could be discussed from more aspects than the one implicit above, that is from a subject matter point of view. We will here discuss three aspects of scientification.

This is a way of classification that is used instead of the traditional classification of curriculum theories as child-centered and discipline-centered, a classification that has been criticized for instance by Harbo (1980) as being to crude. By starting with the concept of scientification we hope to exceed the limits of that categorisation.

1) Scientification of teaching - adoption of the scientific subject matter disciplines into the school subjects.

During the sixties the scientification of teaching is usually referred to as the application of content, structure and methods of a scientific discipline into the corresponding school subject. In USA and elsewhere well-known scientists were directly involved in curriculum development, especially in the natural sciences. Karplus work on physics can be seen as a prominent example. Scientification in this context thus means a scientific subject content taught in schools.

2) Scientification of teaching - the adoption of learning theory and/or developmental theory to teaching problems.

Another way of understanding the concept of scientification is to look at the scientific discipline of psychology. Different psychological theories claim to have scientific solutions to the problems of teaching. Dewey can be mentioned as one of the earliest and most important. The theories of Skinner, Bloom, Bruner and Piaget are other examples of scientific attempts from psychology. These theories are (although different in vital aspects) characterised by the premise of general structures of development, learning and teaching, that are supposed to be relatively independent of a specific discipline the psychological theories in teaching stress the common elements. Bloom's taxonomy (1956) has the ambition to be a category system describing

every subject independent of content. Bruner's theory of development and of learning (1972) claims a general scientific approach to teaching irrespective of subject matter.

In the works of Andersson and Kärrqvist (1979) the two scientification aspects mentioned are combined. They use a scientific subject matter perspective as well as a scientific psychological perspective, but no interest is shown in the social meaning of the content.

These two aspects of scientification do not have a strong interest in/do not analyse the historic and social relations of teaching. Such a perspective is of course also possible. Lybeck (1979a)has for instance described the development of school-physics in a historic and philosophical perspective.

3) Scientification of teaching - a societal perspective.

During the last decade a developing research on the sociology of education has taken up these problems and has thereby expanded them. From an analysis of society and an analysis of teaching the content and methods of teaching is questioned. The social nature of teaching is thus analysed by the "new sociologists" in England (Young 1971) and by Callewaert & Nilsson in Sweden (1975).

The german researcher Fichtner (1980) represents in that perspective a more qualified position. To Fichtner scientification of teaching is the central problem. He poses the question: How can a teacher that is not a scientist adopt a scientific relation to the reality and to the problems of teaching? How can he be able to create teaching situations that have a scientific point or departure and to present to the student a scientific perspective of the world?

Scientification is thus for Fichtner the simultaneous application of scientific theories in the psychological, social and subject-content dimensions. He thereby stresses the content: A scientific orientation of teaching is only possible through the integration of the subject, the psychological and the social dimensions of teaching. The content is the forms of this integration.

For Fichtner scientific teaching is that which develops a content that is of societal relevance and meaning to different groups of students. At

the same time the content must represent central facts, structures, methods, concepts of the discipline and be adopted to the students developmental positions.

To Fichtner content has an inherent social significance. He quotes Klafki's categorisation of content:

a) content that has an *emancipatory* potential
b) content that is originally *instrumental*

Potentially emancipatoric content deals with the political and economic structure of society but does also include moments of e.g. biology, chemistry and physics that gives students a possibility to understand themselves and the world around them in an emancipatoric perspective. Klafki exemplifies with education of drugs, sex and environmental conditions.

Instrumental content on the other hand is superficially valueneutral. It can thus lead to a teaching that is emancipatoric as well as conservative. Klafki gives as examples learning how to write and read, how to read a map etc.

The consequences drawn to teaching seen from this scientific perspective are

a) instrumental content must be subordinated to and integrated in an emancipatoric context
b) methods that force the students to develop an emancipatoric attitude towards the content must be adopted

The problem of scientification

The position held by Fichtner points to the teacher as one key to a scientification of teaching. It is through his or her actions and by him or her this integration takes place.

But the real problem is to create the conditions necessary for such a teaching. That problem is basically political. This can partly be done by a reconceptualisation of the curriculum, responsible to politicians. The content of school is in the last instance not a scientific issue, it is political. One of the first tasks in reconceptualist curriculum work is to identify the historical and social determinants of the content, organisation and form of teaching (Englund 1981). The promoting of such an attempt of scientifica-

tion cannot be seen as a research problem for neither subject matter specialists, social scientists nor learning experts alone.

To summarize:
To reach a scientification of teaching a historical and societal perspective is a necessity by which the determinants of the content and form of teaching is identified. By identifying and questioning the determinants, an incitament of educational change is shaped. The determinants are not eternal, but open to change by political decisions.

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1) The fact that we are here using the term "reconceptualisation" does not mean that we attach ourselves to the "movement of reconceptualisation" that has recently developed in USA.

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